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Substitute for form 1449/PTO				***Complete if Known***	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT				**Application Number**	10/680,629
				Filing Date	10/6/2003
Date Submitted: September 18, 2009				**First Named Inventor**	Apurva Mody
				Art Unit	2611
(use as many sheets as necessary)				Examiner Name	Betsy Lee Deppe
Sheet	1	of	4	Attorney Docket Number	088245-6147

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		2001/0031019	10-18-2001	JAFARKHANI ET AL.	
		2001/0050964	12-13-2001	FOSCHINI ET AL.	
		2001/0053143	12-20-2001	LI ET AL.	
		2002/0003774	01-10-2002	WANG ET AL.	
		2002/0044524	04-18-2002	LAROIA ET AL.	
		2002/0122381	09-05-2002	WU ET AL.	
		2002/0154705	10-24-2002	WALTON ET AL.	
		2002/0181390	12-05-2002	MODY ET AL.	
		2002/0181509	12-05-2002	MODY ET AL.	
		2002/0191703	12-19-2002	LING ET AL.	
		2003/0043928	11-01-2005	LING ET AL.	
		2006/0227904	10-12-2006	MUELLER-WEINFURTNER; STEFAN ET AL.	
		5,867,478	02-02-1999	BAUM ET AL.	
		6,029,058	02-22-2000	NAMGOONG ET AL.	
		6,058,105	05-02-2000	HOCHWALD ET AL.	
		6,088,408	07-11-2000	CALDERBANK ET AL.	
		6,115,427	09-05-2000	CALDERBANK ET AL.	
		6,125,149	09-26-2000	JAFARKHANI ET AL.	
		6,137,847	10-24-2000	STOTT ET AL.	
		6,148,024	11-14-2000	HO ET AL.	
		6,185,258	02-06-2001	ALAMOUTI ET AL.	
		6,188,736	02-13-2001	LO ET AL.	
		6,317,411	11-13-2001	WHINNETT ET AL.	
		6,373,861	04-16-2002	LEE, HYUN-KYU	
		6,473,467	10-29-2002	WALLACE ET AL.	
		6,542,556	04-01-2003	KUCHI ET AL.	
		6,546,055	04-08-2003	SCHMIDL ET AL.	
		6,549,581	04-15-2003	IZUMI, SEIICHI	
		6,693,982	02-17-2004	NAGUIB ET AL.	
		6,771,706	08-03-2004	LING ET AL.	
		6,792,035	09-14-2004	KONTOLA, ILKKA	
		6,850,481	02-01-2005	WU ET AL.	
		6,865,237	03-08-2005	BOARIU ET AL.	
		6,888,899	05-03-2005	RALEIGH ET AL.	
		6,952,454	10-04-2005	JALALI ET AL.	

Examiner Signature	/Betsy Deppe/	Date Considered	03/02/2010

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(use as many sheets as necessary)				Art Unit	2611
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U.S. PATENT DOCUMENTS

		Document Number			
		6,961,388	11-01-2005	LING ET AL.	
		6,985,434	01-10-2006	WU ET AL.	
		6,996,195	02-07-2006	KADOUS	
		7,010,029	03-07-2006	NAGUIB ET AL.	
		7,058,140	06-06-2006	SMART	
		7,110,350	09-19-2006	LI ET AL.	
		7,133,459	11-07-2006	ONGGOSANUSI ET AL.	
		7,139,321	11-21-2006	GIANNAKIS, ET AL.	
		7,149,239	12-12-2006	HUDSON	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3] Number[4] Kind Code[5] (*if known*)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Documents	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T[6]

NON PATENT LITERATURE DOCUMENTS

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		Alamouti, Siavash M., "A Simple Transmit Diversity Technique for Wireless Communications," IEEE Journal on Select Areas in Communication, vol. 16, No. 8, Oct. 1998, pp. 1451-1458.	
		Biedka, T.E.: "A comparison of initialization schemes for blind adaptive beamforming," Acoustics, Speach and Signal Processing, 1998. ICASSP '98. Proceedings of the 1998 IEEE International conference on; vol. 2, May 12-15, 1998 pp. 1665-1668 vol. 3.	
		Jafarkhani, H.; "A Quasi-Orthogonal Space-Time Block Code," Communications, IEEE Transactions on Communications, vol. 49, Issue 1, Jan. 2001 pp. 1-4.	
		Li, Ye (Geoffrey), Seshadri, Nambirajan, and Ariyavisitakul, Sirikiat, "Channel Estimation for OFDM Systems with Transmitter Diversity in Mobile Wireless Channels," IEEE Journal on Selected Areas in Communications, vol. 17, No. 3, March 1999, pp. 461-471.	

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		Mody, A.N. and Stuber, G.L.; "Parameter Estimation for OFDM with Transmit-Receive Diversity," Proceedings of VTC Rhodes, Greece, 2001.	
		Mody, A.N. and Stuber, G.L.; "Receiver Implementation for a MIMO OFDM System," Proceedings of GLOBECOM 2002, Taipei, Taiwan, Nov. 2002.	
		Mody, A.N.; Stuber, G.L.; "Synchronization of MIMO OFDM Systems," Proceedings of GLOBECOM 2001, San Antonio, 2001, vol. 1, pp. 509-513.	
		Mody, Apurva N. and Stuber, Gordon L., "Efficient Training and Synchronization Sequence Structures for MIMO OFDM," School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, GA 30332 and Wi-LAN, Wireless Data Communications Inc., Atlanta, Georgia, 2001, pp. 1-7.	
		Mody, Apurva N. and Stuber, Gordon L., "Parameter Estimation for MIMO OFDM Systems," School of Electrical and Computer Engineering, Georgia Institute of Technology, 2001, Atlanta, GA.	
		Naguib, A.F.; Tarokh, V.; Seshadri, N.; Calderbank, A.R.; "Space-time coded modulation for high data rate wireless communications," Global Telecommunications conference, 1997. Globecom '97., IEEE vol. 1, Nov. 3-8, 1997 pp. 102-109 vol. 1.	
		Schmidl, Timothy M. and Cox, Donald C., "Robust Frequency and Timing Synchronization for OFDM," IEEE Transactions on Communications, vol. 45, No. 12, December 1997, pp. 1613-1621.	
		Tarokh, Vahid, Jafarkhani Hamid, and Calderbank, A.R., "Space-Time Block Codes from Orthogonal Designs," IEEE Transactions on Information Theory, vol. 45, No. 5, July 1999, pp. 1456-1467.	
		Tarokh, Vahid, Jafarkhani, Hamid, and Calderbank, A. Robert, "Space-Time Block Coding for Wireless Communications: Performance Results," IEEE Journal on Selected Areas in Communications, vol. 17, No. 3, March 1999, pp. 451-460.	
		Weisstein, Eric W., "Gram-Schmidt Orthonormalization." From MathWorld-A Wolfram Web Resource. http://mathworld.wolfram.com/Gram-SchmidtOrthonormalization.html; copyright 1999-2006, printed 3/16/2006.	
		Notice of Allowability for U.S. Patent Application No. 10/245.090 dated June 8, 2007.	
		Office Action for U.S. Patent Application No. 10/245,090 mailed November 24, 2006.	

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		Office Action for U.S. Patent Application No. 10/245,090 mailed March 20, 2006.	
		Notice of Allowability for U.S. Patent Application No. 10/128,821 dated March 7, 2006.	
		Office Action for U.S. Patent Application No. 10/128,821 mailed December 8, 2005.	
		Notice of Allowability for US. Patent Application No. 10/128,756 dated August 22, 2007.	
		Office Action for U.S. Patent Application No. 10/128,756 mailed January 26, 2007.	
		Office Action for U.S. Patent Application No. 10/128,756 mailed March 8, 2006.	
		Notice of Allowability for U.S. Patent Application No. 10/264,546, mailed June 19, 2007.	
		Office Action for U.S. Patent Application 10/264,546, mailed October 24, 2006.	

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